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The Applicant claims for priority information of  
this application is as follows :

1. Title : Number Lock Device For Computer
2. Filing No. : 91213425
3. Filing Date : 26 August,2002
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Respectfully submitted,

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08/21/03

# NUMBER LOCK DEVICE FOR COMPUTER

## BACKGROUND OF THE INVENTION

### 1. Field of the Invention

The present invention relates to a number lock device for locking a computer, and more particularly to a number lock device that can be operated by the user's one hand only, thereby facilitating the user operating the number lock device.

### 2. Description of the Related Art

A conventional lock device in accordance with the prior art shown in Figs. 1-4 comprises a housing 1, an inner barrel 2 inserted into the housing 1 and having a distal end having a periphery formed with an outer ring 201 and having an end face formed with a through hole (not shown) for passage of a key (not shown), a mounting ring 4 mounted on the inner barrel 2 located between the housing 1 and the outer ring 201 and provided with a cable 401, and a lock core 3 mounted in the inner barrel 2. The lock core 3 includes a positioning ring 303 having an end face provided with two spaced locking tongues 304 protruding outward from the housing 1, and a lock bolt 301 rotatably mounted in the inner barrel 2 and having a first end formed with a key hole (not shown) communicating with the through hole for passage of the key and a second end formed with an enlarged head 302 extending between the two locking tongues 304 and protruding outward from the housing 1.

1           In operation, the cable 401 is passed through a fixed upright or leg,  
2   and the housing 1 is then passed through the loop 402 of a distal end of the  
3   cable 401 as shown in Fig. 3. In such a manner, when the enlarged head 302 is  
4   aligned with the connecting line between the two locking tongues 304 as  
5   shown in Fig. 1, the lock core 3 is disposed at an unlocked state. Thus, the  
6   enlarged head 302 and the two locking tongues 304 can be inserted into the  
7   elongated slot 901 of the shell 9 of a computer, and the enlarged head 302 can  
8   be extended into the elongated slot 92 of the shell 90. Then, the key is rotated  
9   to rotate the lock core 3, so that the lock core 3 is disposed at an unlocked state.  
10   At this time, the two locking tongues 304 are fixed by the wall of the elongated  
11   slot 901 without rotation, so that the enlarged head 302 can be rotated from the  
12   position as shown in Fig. 1 to the position as shown in Fig. 4, where the  
13   enlarged head 302 is vertical to the connecting line between the two locking  
14   tongues 304. At this time, the enlarged head 302 is rested on and locked by the  
15   inner wall of the shell 9 of the computer, so that the conventional lock device is  
16   locked on the shell 9 of the computer as shown in Fig. 3, thereby providing an  
17   anti-theft function. However, the conventional lock device is operated by the  
18   user's two hands, thereby causing inconvenience to the user.

19           The closest prior art of which the applicant is aware is disclosed in  
20   his U.S. Patent No. 6,536,244, entitled "COMPUTER SECURITY DEVICE".

21                           **SUMMARY OF THE INVENTION**

1           The primary objective of the present invention is to provide a number  
2 lock device that can be operated by the user's one hand only, thereby  
3 facilitating the user operating the number lock device.

4           Another objective of the present invention is to provide a number  
5 lock device, wherein the correct numbers of the number rings of the lock core  
6 of the number lock device can be changed easily and conveniently.

7           In accordance with the present invention, there is provided a number  
8 lock device, comprising a lock housing, a lock core, and a cover, wherein:

9           the lock housing has a first end having an inside formed with a  
10 receiving chamber, the lock housing has two opposite faces each formed with a  
11 plurality of through holes and has a side formed with a plurality of windows;

12          the lock core is mounted in the lock housing and includes a plurality  
13 of number rings each rotatably mounted in a respective one of the through  
14 holes of the lock housing, a first locking ring and a plurality of second locking  
15 rings each mounted in a respective one of the number rings, and a lock core rod  
16 having a first end provided with a catch plate and a second end extended  
17 through a spring and each of the first locking ring and the second locking rings;

18          the number lock device further comprises a movable member, a  
19 driving member, a locking plate, and a locking pin each mounted in the  
20 receiving chamber of the lock housing and located between the lock core and  
21 the cover;

1           the movable member has a first side formed with a rectangular  
2   insertion recess for insertion of the catch plate of the lock core rod and a  
3   second side formed with four triangular first teeth and four first engaging  
4   grooves each located between any two adjacent first teeth;

5           the driving member is engaged with the movable member and has a  
6   first side formed with four triangular second teeth each mounted in a respective  
7   one of the first engaging grooves of the movable member and four second  
8   engaging grooves each located between any two adjacent second teeth,  
9   wherein each of the first teeth of the movable member is mounted in a  
10   respective one of the second engaging grooves of the driving member, the  
11   driving member has a second side formed with an insertion groove;

12          the locking plate has a first end inserted into the insertion groove of  
13   the driving member and formed with a mounting hole, and a second end  
14   formed with two locking legs extended through the cover and a channel  
15   located between the two locking legs and communicating with the mounting  
16   hole; and

17          the locking pin is pivotally mounted in the channel of the locking  
18   plate and has a first end mounted in the mounting hole of the locking plate and  
19   locked on the lock housing and has a second end formed with a locking block  
20   extended outward from the channel of the locking plate and the cover.

1 Further benefits and advantages of the present invention will become  
2 apparent after a careful reading of the detailed description with appropriate  
3 reference to the accompanying drawings.

4 **BRIEF DESCRIPTION OF THE DRAWINGS**

5 Fig. 1 is a partially cut-away perspective view of a conventional lock  
6 device in accordance with the prior art;

7 Fig. 2 is an exploded perspective view of the conventional lock  
8 device as shown in Fig. 1;

9 Fig. 3 is a perspective operational view of the conventional lock  
10 device as shown in Fig. 1;

11 Fig. 4 is a partially cut-away side plan operational view of the  
12 conventional lock device as shown in Fig. 3;

13 Fig. 5 is a partially cut-away perspective view of a number lock  
14 device in accordance with the preferred embodiment of the present invention;

15 Fig. 6 is an exploded perspective view of the number lock device as  
16 shown in Fig. 5;

17 Fig. 7 is a perspective operational view of the number lock device as  
18 shown in Fig. 5;

19 Fig. 8 is a plan cross-sectional view of the number lock device as  
20 shown in Fig. 5;

21 Fig. 9 is a plan cross-sectional view of the number lock device taken  
22 along line 9-9 as shown in Fig. 8;

1            Fig. 10 is a plan operational view of the number lock device as  
2 shown in Fig. 5;

3            Fig. 11 is an operational view of the number lock device as shown in  
4 Fig. 10;

5            Fig. 12 is an operational view of the number lock device as shown in  
6 Fig. 11;

7            Fig. 13 is a partially cut-away enlarged view of the number lock  
8 device as shown in Fig. 8; and

9            Fig. 14 is an operational view of the number lock device as shown in  
10 Fig. 13.

# 11            **DETAILED DESCRIPTION OF THE INVENTION**

12            Referring to the drawings and initially to Figs. 5-10, a number lock  
13 device in accordance with the preferred embodiment of the present invention  
14 comprises a lock housing 10, a lock core 20, a cover 30, and a cable 40.

15            The lock housing 10 has a first end formed with a pivot sleeve 11 and  
16 a second end provided with a movable push button 13. The first end of the lock  
17 housing 10 has an inside formed with a receiving chamber 19. The receiving  
18 chamber 19 of the lock housing 10 has a wall formed with two opposite  
19 elongated guide grooves 192 and two opposite locking grooves 15. The lock  
20 housing 10 includes a first shell 12 and a second shell 14 combined with each  
21 other. The lock housing 10 has two opposite faces each formed with a plurality  
22 of through holes 16 and has a side formed with a plurality of windows 18. The

1 second end of the lock housing 10 is formed with an elongated receiving hole  
2 17 for receiving the push button 13.

3 The push button 13 includes a slide 136 (see Fig. 8) slidably mounted  
4 in the receiving hole 17 of the lock housing 10, a push plate 132 mounted on a  
5 first side of the slide 136 and protruded outward from the receiving hole 17 of  
6 the lock housing 10, and a guide plate 134 mounted on a second side of the  
7 slide 136 and extended into the receiving hole 17 of the lock housing 10. The  
8 guide plate 134 of the push button 13 is provided with a protruding urging  
9 portion 138 facing the lock core 20 and having an end formed with an oblique  
10 guide face 1382.

11 The lock core 20 is mounted in the lock housing 10 and includes a  
12 plurality of number rings 21 each rotatably mounted in a respective one of the  
13 through holes 16 of the lock housing 10, a first locking ring 22 and a plurality  
14 of second locking rings 23 each mounted in a respective one of the number  
15 rings 21, a lock core rod 24 having a first end provided with a catch plate 242  
16 and a second end extended through a spring 244 and each of the first locking  
17 ring 22 and the second locking rings 23, and a reed 25 located in the lock  
18 housing 10 and mounted on the number rings 21. The first locking ring 22 has  
19 an end formed with a lug 222 rested on the guide face 1382 of the urging  
20 portion 138 of the guide plate 134 of the push button 13. The spring 244 has a  
21 first end rested on the catch plate 242 of the lock core rod 24 and a second end  
22 rested on one of the second locking rings 23.



1           The number lock device further comprises a movable member 50, a  
2 driving member 60, a locking plate 70, and a locking pin 80 each mounted in  
3 the receiving chamber 19 of the lock housing 10 and located between the lock  
4 core 20 and the cover 30.

5           The movable member 50 has a periphery formed with two opposite  
6 ears 52 each movably mounted in a respective one of the two guide grooves  
7 192 of the receiving chamber 19 of the lock housing 10, so that the movable  
8 member 50 is movably mounted in the receiving chamber 19 of the lock  
9 housing 10 without rotation. The movable member 50 has a first side formed  
10 with a rectangular insertion recess 54 (see Fig. 9) for insertion of the catch  
11 plate 242 of the lock core rod 24, so that the lock core rod 24 of the lock core  
12 20 is positioned on the movable member 50 without rotation. The movable  
13 member 50 has a second side formed with four symmetrically arranged  
14 triangular first teeth 56 arranged in a radiating manner and four first engaging  
15 grooves 58 each located between any two adjacent first teeth 56. Each of the  
16 first teeth 56 of the movable member 50 has two sides formed with two  
17 symmetrically arranged first inclined face 562.

18           The driving member 60 is mounted between the movable member 50  
19 and the cover 30 and is engaged with the movable member 50. The driving  
20 member 60 has a first side formed with four symmetrically arranged triangular  
21 second teeth 62 each mounted in a respective one of the first engaging grooves  
22 58 of the movable member 50 and four second engaging grooves 64 each

1 located between any two adjacent second teeth 62. Each of the first teeth 56 of  
2 the movable member 50 is mounted in a respective one of the second engaging  
3 grooves 64 of the driving member 60. Each of the second teeth 62 of the  
4 driving member 60 has two sides formed with two symmetrically arranged  
5 second inclined face 622. The driving member 60 has a second side formed  
6 with an insertion groove 66.

7           The locking plate 70 has a first end inserted into the insertion groove  
8 66 of the driving member 60 and formed with a mounting hole 72, and a  
9 second end formed with two locking legs 74 extended through the cover 30  
10 and a channel 742 located between the two locking legs 74 and communicating  
11 with the mounting hole 72.

12           The locking pin 80 is pivotally mounted in the channel 742 of the  
13 locking plate 70 and has a first end mounted in the mounting hole 72 of the  
14 locking plate 70 and having two sides each formed with a wing plate 82  
15 extended outward from a wall of the mounting hole 72 of the locking plate 70  
16 and locked in a respective one of the two locking grooves 15 of the receiving  
17 chamber 19 of the lock housing 10, so that the locking pin 80 is moved in  
18 concert with the lock housing 10. The locking pin 80 has a second end formed  
19 with a locking block 84 extended outward from the channel 742 of the locking  
20 plate 70 and the cover 30 as shown in Fig. 5.

21           The cable 40 has a first end formed with a first loop 42 mounted on a  
22 fixing ear 462 of a mounting ring 46 which is mounted on the pivot sleeve 11

1 of the lock housing 10. The cable 40 has a second end formed with a second  
2 loop 44. The second loop 44 of the cable 40 is passed through a fixed upright or  
3 leg, and the lock housing 10 is then passed through the second loop 44 of the  
4 cable 40 as shown in Fig. 7.

5           The cover 30 is mounted on the pivot sleeve 11 of the lock housing  
6 10 and is rested on the mounting ring 46 to position the lock core 20 in the lock  
7 housing 10. The cover 30 is fixed on the pivot sleeve 11 of the lock housing 10  
8 by a pin 32. The cover 30 has an inside formed with two protruding press  
9 blocks 34 to press the wing plate 82 of the locking pin 80 to position the wing  
10 plate 82 of the locking pin 80 in a respective one of the two locking grooves 15  
11 of the receiving chamber 19 of the lock housing 10.

12           In operation, referring to Figs. 5-12, when the number rings 21 of the  
13 lock core 20 are rotated to the correct numbers, the lock core 20 is disposed at  
14 an unlocked state, so that the lock core rod 24 of the lock core 20 is movable in  
15 the lock housing 10.

16           The locking block 84 of the locking pin 80 is initially aligned with  
17 the connecting line between the two locking legs 74 of the locking plate 70 as  
18 shown in Fig. 5, so that the locking block 84 of the locking pin 80 and the two  
19 locking legs 74 of the locking plate 70 can be inserted into the elongated slot  
20 92 of the shell 90 of a computer as shown in Fig. 7, and the locking block 84 of  
21 the locking pin 80 can be extended into the elongated slot 92 of the shell 90.

1           At this time, the two locking legs 74 of the locking plate 70 are fixed  
2 by the wall of the elongated slot 92 without rotation, so that the locking plate  
3 70 and the driving member 60 are fixed and cannot be rotated by the lock  
4 housing 10, while the movable member 50 and the locking pin 80 can be  
5 rotated by the lock housing 10.

6           Then, the lock housing 10 can be rotated to rotate the movable  
7 member 50 and the locking pin 80, so that the locking pin 80 is rotated relative  
8 to the locking plate 70, and the movable member 50 is rotated relative to the  
9 driving member 60. Thus, the locking block 84 of the locking pin 80 can be  
10 rotated from the position as shown in Fig. 10 to the position as shown in Fig. 11  
11 and then to the position as shown in Fig. 12, so that the locking block 84 of the  
12 locking pin 80 is vertical to the connecting line between the two locking legs  
13 74 of the locking plate 70.

14           At this time, the locking block 84 of the locking pin 80 is rested on  
15 and locked by the inner wall of the shell 90 of the computer, so that the number  
16 lock device is locked on the shell 90 of the computer as shown in Fig. 7.

17           Then, the number rings 21 of the lock core 20 are rotated to the  
18 incorrect numbers, so that the lock core rod 24 of the lock core 20 is locked by  
19 the first locking ring 22 and the second locking rings 23 without movement,  
20 and the lock core 20 is disposed at a locked state. At this time, the movable  
21 member 50 is engaged with the driving member 60, and the lock core rod 24 of  
22 the lock core 20 is rested on the movable member 50, so that the movable

1 member 50 is fixed without movement and the lock housing 10 cannot be  
2 rotated, thereby providing an anti-theft function.

3           Accordingly, the user only needs to insert the locking block 84 of the  
4 locking pin 80 and the two locking legs 74 of the locking plate 70 into the  
5 elongated slot 92 of the shell 90 of the computer and to rotate the lock housing  
6 10 so as to lock the number lock device, so that the number lock device can be  
7 operated by the user's one hand only, thereby facilitating the user operating the  
8 number lock device.

9           Referring to Fig. 13 and 14 with reference to Fig. 6, the number rings  
10 21 of the lock core 20 are rotated to the correct numbers, thereby releasing the  
11 locking state between the lock core rod 24 of the lock core 20 and the first  
12 locking ring 22 and the second locking rings 23 of the lock housing 10, so that  
13 the lock core rod 24 of the lock core 20 can be moved relative to the first  
14 locking ring 22 and the second locking rings 23 of the lock housing 10. Then,  
15 the push button 13 is pushed to move the guide plate 134, so that the urging  
16 portion 138 of the guide plate 134 is moved from the position as shown in Fig.  
17 13 to the position as shown in Fig. 14, to push and move the lug 222 of the first  
18 locking ring 22, thereby axially moving the first locking ring 22 and the second  
19 locking rings 23 gradually, and thereby compressing the spring 244.

20           At this time, the push button 13, the first locking ring 22 and the  
21 second locking rings 23 are disposed at a positioning state, and will not be  
22 returned to the original position after the force applied on the push button 13 is

1 released. Then, the number rings 21 of the lock core 20 are rotated to the new  
2 correct numbers. At this time, the first locking ring 22 and the second locking  
3 rings 23 are not rotated with the number rings 21 of the lock core 20. Then, the  
4 push button 13 is pushed backward to release the urging portion 138 of the  
5 guide plate 134 from the lug 222 of the first locking ring 22. At this time, the  
6 first locking ring 22 and the second locking rings 23 are returned to the original  
7 position by the restoring force of the spring 244, and are locked with the  
8 number rings 21 of the lock core 20. Thus, the correct numbers of the number  
9 rings 21 of the lock core 20 can be changed easily and conveniently.

10           Although the invention has been explained in relation to its preferred  
11 embodiment(s) as mentioned above, it is to be understood that many other  
12 possible modifications and variations can be made without departing from the  
13 scope of the present invention. It is, therefore, contemplated that the appended  
14 claim or claims will cover such modifications and variations that fall within the  
15 true scope of the invention.